

# Work Order ID 79010

January-18-12 1:51:55 PM

\*79010\*

~~U/R~~

Page 1

Item ID: D350-748-141TRN

Accept

\*N9000040100\*

Setup Start \*NS1\*

Revision ID: ~~U/R~~

Item Name: Crosstube Turning Detail

Stop \*NS2\*

Start Date: 18/01/2012 Start Qty: 1.00

\*1\*

Cust Item ID:

Required Date: 20/01/2012 Req'd Qty: 1.00

\*1\*

Customer:

Reference:

Approvals: Process Plan: M.L.J

Date: 12/01/18

Tooling:

Date:

Run Start \*NR1\*

QC:

Date:

SPC (Y/N):

Date:

Stop \*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D350-748-141	F U/R OK 12.01.19

100 0.00

\*100\*

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends as per Folio FA648

2-Turn first side as per Folio FA648

3- File transition lines smooth.

FOLIO REV: 11

DWG REV: 1

M.M.L 12/02/01

110

QC1- Inspect dimensions to dimension sheet

0.00

\*110\*

QC

Memo

0.00

Quality Control

M.M.L 12/02/01

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10/10/15	1							

NOTE: Date & initial all entries

# Work Order ID 79010

\*79010\*

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Item ID: D350-748-141TRN

Accept

\*N900040100\*

Setup Start

\*NS1\*

Revision ID: U/R

Item Name: Crosstube Turning Detail

Stop

\*NS2\*

Start Date: 18/01/2012 Start Qty: 1.00

\*1\*

Cust Item ID:

Required Date: 20/01/2012 Req'd Qty: 1.00

\*1\*

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

\*NR1\*

QC:

Date:

SPC (Y/N):

Date:

Stop

\*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
<b>*120*</b>	MORI SEIKI CNC LATHE LARGE								
Mori Seiki	<b>Memo</b>	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA648 2- File transition lines smooth. 3-Scribe Part & Batch as per Dwg D350-748-141 FOLIO REV: <u>  A  </u> DWG REV: <u>  F  </u>								
130	QC1- Inspect dimensions to dimension sheet	0.00							
<b>*130*</b>									
QC	<b>Memo</b>	0.00							
Quality Control									
140	QC8- Inspect parts - second check	0.00							
<b>*140*</b>									
QC	<b>Memo</b>	0.00							
Quality Control									

1 Ø  
M.M.L 12/02/01

1 Ø  
M.M.L 12/02/01

12-2-7

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10/20/01	1							
17/10/01	1							

NOTE: Date & initial all entries

# Work Order ID 79010

\*79010\*

Page 3

January-18-12 1:51:55 PM

Item ID: D350-748-141TRN

Accept

\*N900040100\*

Setup Start \*NS1\*

Revision ID: U/R

Stop \*NS2\*

Item Name: Crosstube Turning Detail

Start Date: 18/01/2012 Start Qty: 1.00 \*1\*

Cust Item ID:

Required Date: 20/01/2012 Req'd Qty: 1.00 \*1\*

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start \*NR1\*

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop \*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

150

0.00

\*150\*

Large Fab

Crosstubes

Memo

0.00

Crosstubes

Grind machining marks

RM

12-2-7

PTO

160

Outsource process - Heat Treat

0.00

\*160\*

Outsource1

Memo

0.00

Outsource process - Heat Treat

Issue P/O: 16600  
Heat Treat to min 180 KSI As per Dwg D350-748-141  
(MIL-T-6736 OR AMS 2759-1C)  
Sand Blast tube after Heat Treat  
Possible Supplier: Vac Aero  
Ensure Certificate of Conformity is attached

CL 12/03/290

170

Receive & Inspect for Damage & Mat'l Certs

0.00

\*170\*

Packaging

Memo

0.00

Packaging

Ensure certificate of conformaty is attached

12/2/2011

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O: 79010		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
12.03.26	151	DRILL $\phi 0.188$ TOOLING HOLE THRU CUFF, (Qty 1) PER CUFF, 2" FROM END. TOOLING HOLES IN EACH CUFF MUST BE PARALLEL TO EACH OTHER. SEE ATTACHED DWG		MO 12-3-26		CP 12.03.26 C/S/1042	

Part No: D350-748-141TRN PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Hand-drawn technical sketch of a mechanical part, likely a pulley or a similar component. The drawing includes the following elements:

- Dimensions:**
  - A dimension line at the bottom indicates a length of  $2.00''$ .
  - A dimension line on the left indicates a diameter of  $\phi 0.188$ .
- Labels:**
  - The text "Tool IN" is written vertically on the left side.
  - The text "TYP 755" is written vertically below "Tool IN".
- Geometry:**
  - The main body is a large circle with a smaller circle inside it.
  - A horizontal line passes through the center of the larger circle.
  - A vertical line passes through the center of the smaller circle.
  - A diagonal line runs from the top left towards the bottom right, passing through the center of the larger circle.
  - A dashed line is shown on the right side, extending from the center of the larger circle.

2.00"  $\nearrow$

# Work Order ID 79010

**\*79010\***

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January-18-12 1:51:55 PM

Item ID: D350-748-141TRN

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID: U/R

Item Name: Crosstube Turning Detail

Stop

**\*NS2\***

Start Date: 18/01/2012 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 20/01/2012 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

**\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop

**\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	QC6- Inspect dimensions to drawing	0.00							
<b>*180*</b>	<i>see last page inspection sheet</i>	<i>8/10/07</i>							
QC	Memo	0.00							
Quality Control									
190	Packaging	0.00							
<b>*190*</b>									
Packaging	Memo	0.00	<i>APP</i>	<i>81517</i>				<i>12/6/25</i>	
Packaging	Identify and stock in kanban rack Location: _____								
200	QC21- Final Inspection - Work Order Release	0.00							
<b>*200*</b>									
QC	Memo	0.00							
Quality Control									

*ME*  
*12-06-25*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Picklist Print

January-18-12 1:51:59 PM

Page 1

Work Order ID: 79010

\*79010\*

Parent Item: D350-748-141TRN

\*D350-748-141TRN\*

Parent Item Name: Crosstube Turning Detail

Start Date: 18/01/2012

Required Date: 20/01/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec  
 IPP Rev B Removed polish 08.04.02 EC verified by : DD  
 IPP Rev C Remove LPS-3 08.06.23 EC verified by DD IPP Rev C  
 11.02.24 as per dwg rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125		Manufactured	No			110	Each	72.0000	1	1			

\*D6015-125\*

Crosstube Material

\*\*

## Location

## Loc Qty

## Loc Code

HALL

72

61380

12

72511

60

1 mml 12/01/31

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 79010
<b>Description:</b> Crosstube Assembly (AS350/355 High Fwd)		<b>Part Number:</b> D350-748-141
<b>Inspection Dwg:</b> D350-748-141 Rev: F		<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.245	✓		mic	CNC-04
	2.180	+0.005/-0.000	2.183	✓			
	2.180	+0.005/-0.000	2.183	✓			
	2.237	+0.005/-0.000	2.238	✓			
	2.272	+0.005/-0.000	2.273	✓			
	2.306	+0.005/-0.000	2.306	✓			
	2.339	+0.007/-0.000	2.345	✓			
	2.339	+0.007/-0.000	2.345	✓			
	0.062	+/-0.010	.062	✓		vern	CNC-08
	4.26	+/-0.030	4.26	✓		II	
	R0.063	+/-0.010	.063	✓		RG	
	R0.50	+/-0.030	.500	✓		II	
SIDE B	2.240	+0.005/-0.000	2.245	✓		mic	CNC-04
	2.180	+0.005/-0.000	2.183	✓			
	2.180	+0.005/-0.000	2.183	✓			
	2.237	+0.005/-0.000	2.239	✓			
	2.272	+0.005/-0.000	2.273	✓			
	2.306	+0.005/-0.000	2.307	✓			
	2.339	+0.007/-0.000	2.344	✓			
	2.339	+0.007/-0.000	2.345	✓			
	0.062	+/-0.010	.062	✓		vern	CNC-08
	4.26	+/-0.030	4.26	✓		II	
	R0.063	+/-0.010	.063	✓		RG	
	R0.50	+/-0.030	.500	✓		II	
	110.27	+/-0.060	110.265	✓		type	MM-L-02

<b>Measured by:</b> MML	<b>Audited by:</b> DP	<b>Preliminary Approval:</b>
<b>Date:</b> 12/01/31	<b>Date:</b> 12-2-7	<b>Date:</b>

Rev	Date	Change	Revised by	Approved
A	06.11.09	New Issue (P/O D350-748-101)	KJ/JLM	
B	07.10.24	Dwg Rev updated	KJ/EC/DD	
C	11.01.20	Dwg Rev updated	KJ	
D	11.07.26	Tolerance revised for 2.339 dimensions	KJ	

1. 1. 1. 1.  
1. 1. 1. 1.

1. 1.

1. 1. 1. 1.

1. 1.

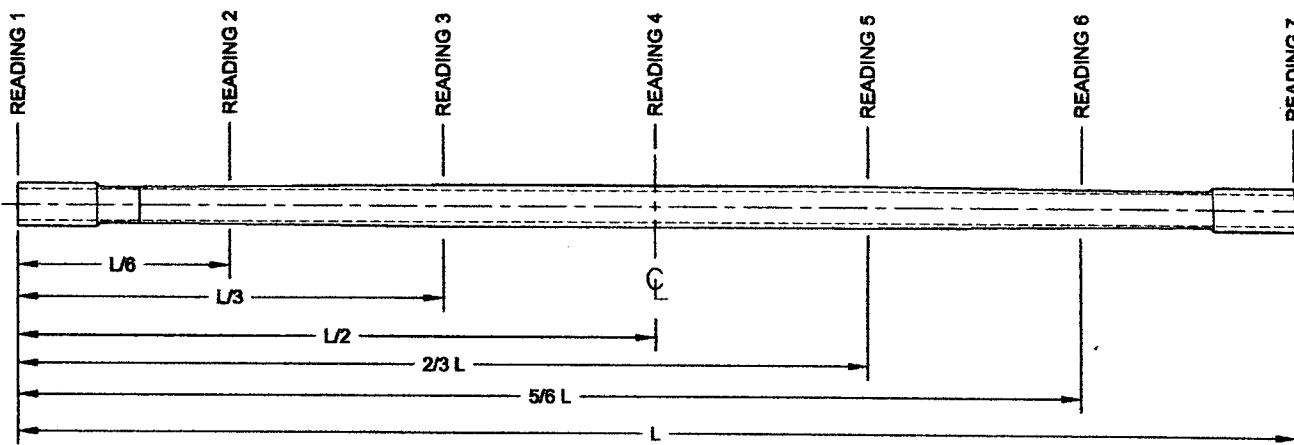
1. 1.

1. 1. 1. 1.

1. 1.

DART AEROSPACE LTD		Work Order: 79010
Description:		Part Number: 350-248-741
Inspection Dwg:		Page 1 of 1

### WALL THICKNESS MEASUREMENT



	WALL THICKNESS MEASUREMENT (IN)				DEVIATION (max-min)	TOLERANCE
	Q1	Q2	Q3	Q4		
READING 1 $L = 0"$						0.030"
READING 2 $L = 18"$	.149	.141	.131	.131		
READING 3 $L = 37"$	.190	.185	.171	.183		
READING 4 $L =$						
READING 5 $L = 18"$	.129	.154	.147	.123		
READING 6 $L = 13"$	.174	.180	.187	.183		
READING 7 $L =$						

## D350 X-TUBE CUFF MEASUREMENTS

TYPE	BATCH #	SIDE A	SIDE B
		TWO READINGS	TWO READINGS
AFT	B79393	2.221"/2.251"	2.227"/2.252"
AFT	B79391	2.251"/2.241"	2.236"/2.252"
AFT	B79392	2.238"/2.248"	2.220"/2.262"
AFT	B73372	2.243"/2.247"	2.223"/2.263"
AFT	B73375	2.245"/2.250"	2.236"/2.266"
FWD	B79010	2.230"/2.252"	2.235"/2.245"
FWD	B79011	2.200"/2.280"	2.248"/2.249"
FWD	B74718	2.208"/2.289"	2.242"/2.252"
FWD	B74673	2.189"/2.298"	2.247"/2.238"
FWD	B74678	2.240"/2.258"	2.262"/2.236"
FWD	B74672	2.253"/2.266"	2.260"/2.253"
FWD	B74712	2.264"/2.251"	2.255"/2.258"
FWD	B74676	2.229"/2.263"	2.239"/2.254"
FWD	B79013	2.249"/2.2236"	2.243"/2.245"

Notes: tubes are NOT sandblasted and are still a little crocked

**REFERENCE ONLY**

8/7/05/ly

UNCLASSIFIED

247

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115  
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2  
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF  
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.  
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO  
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO  
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,  
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,  
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.  
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE  
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO  
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT  
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN  
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY  
RECEIVED  
FNC  
UNCONFIRMED  
SUBJECT  
WITHOUT  
WORK  
NO. 79010 M.C.J.  
12/01/18

UNDER REVIEW

11.07.12

RELEASED  
2011-01-18

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		
<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA DRAWING NO. D350-748-141 TITLE CROSSTUBE (AS 350/355 HI FWD) REV. F SHEET 1 OF 4 SCALE NTS COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

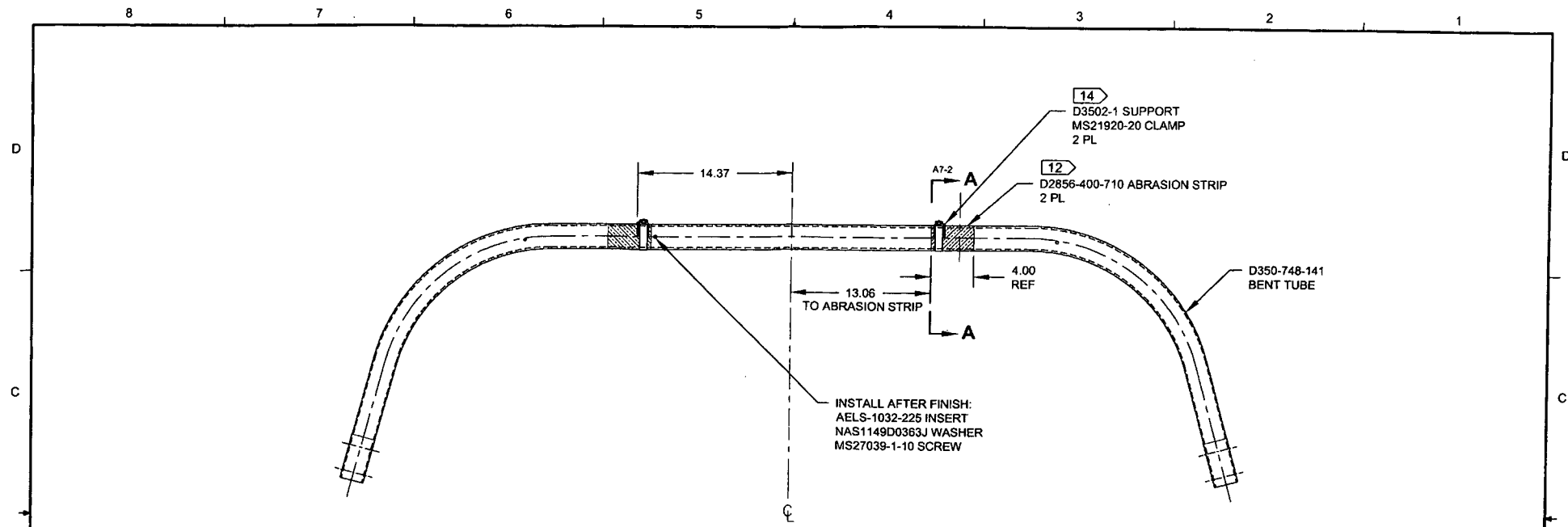
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

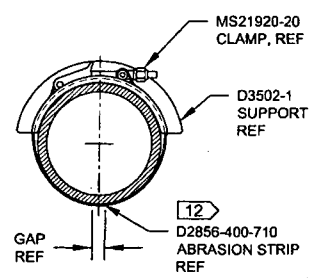
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

79010



**D350-748-141  
ASSEMBLY DETAIL**



**SECTION A-A D4-2  
SCALE 4X**

UNDER REVIEW

11.07.11

**RELEASED**  
2011-01-18

DESIGN		<b>DART AEROSPACE LTD</b>	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D350-748-141	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O: <u>000</u>		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

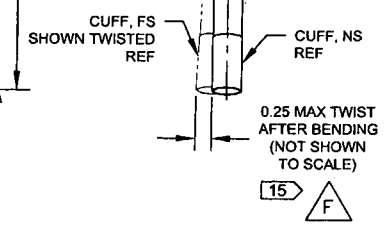
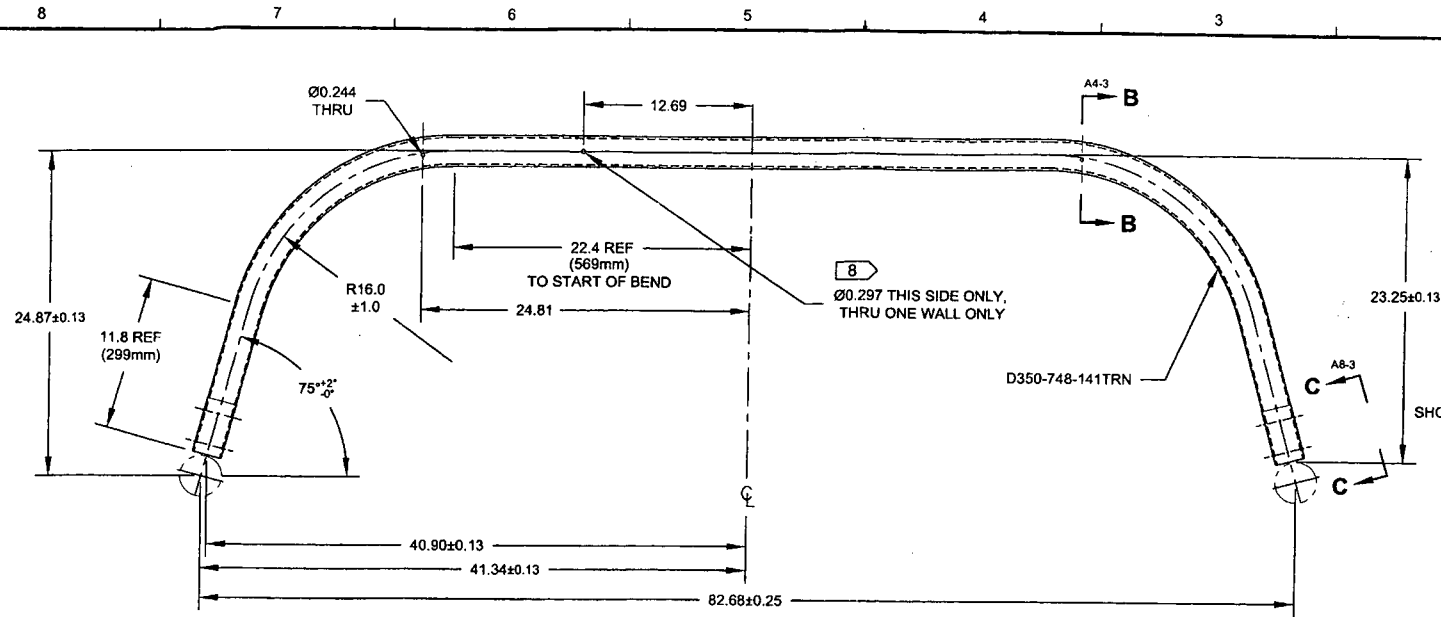
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

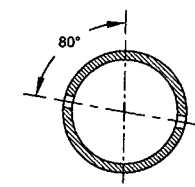
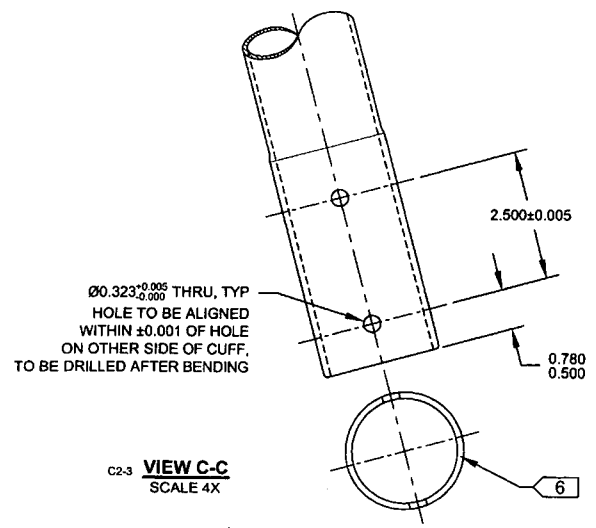
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

79010



**D350-748-141**  
**BENDING AND DRILLING DETAIL** 10



UNDER REVIEW  
11.07.12

RELEASED  
2011-01-18  
MMD

DESIGN	90	<b>DART AEROSPACE LTD</b>	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	1	DRAWING NO.	REV. F
MFG. APPR.	2	D350-748-141	SHEET 3 OF 4
APPROVED	3	TITLE	SCALE
DE APPR.	4	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

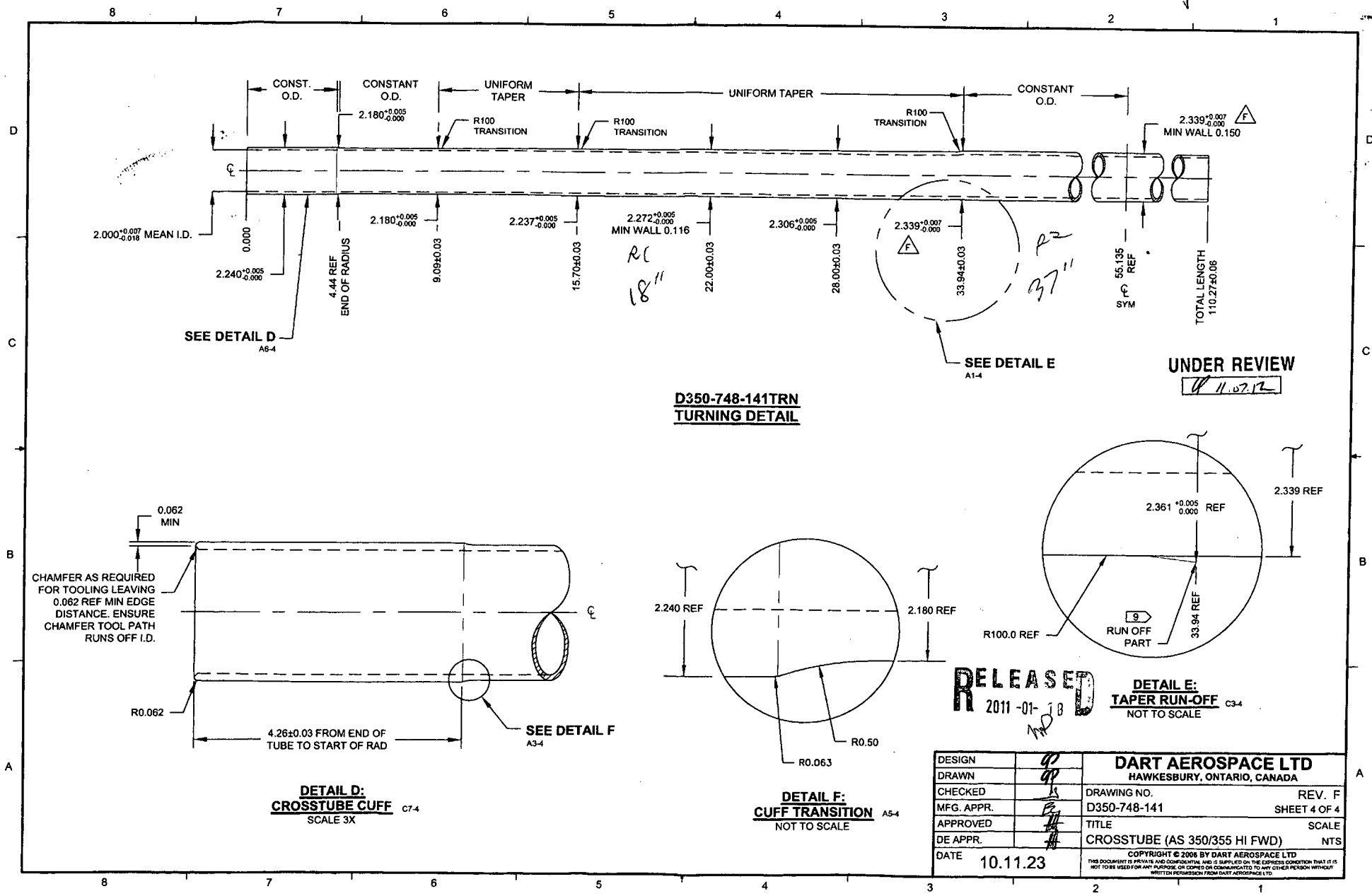
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

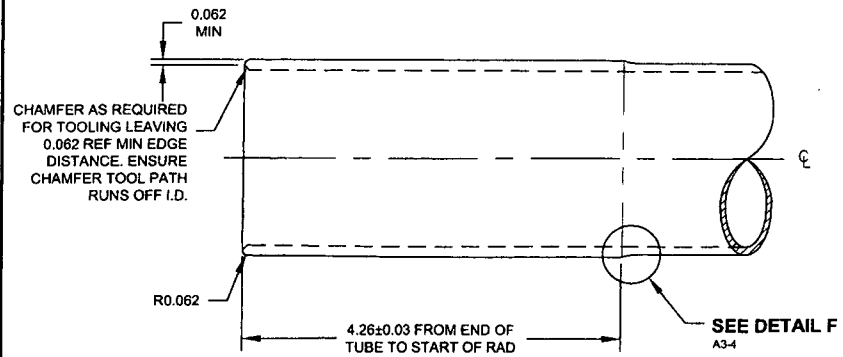
NOTE: Date & initial all entries

79010

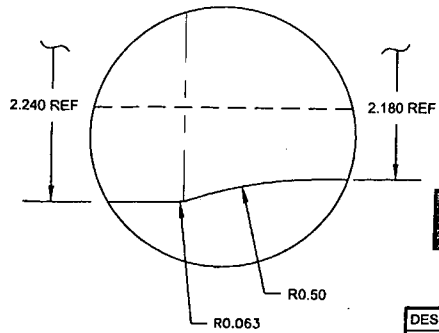


**D350-748-141TRN  
TURNING DETAIL**

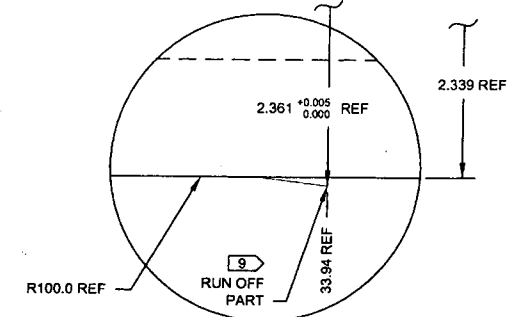
**UNDER REVIEW**  
11.07.12



**DETAIL D:  
CROSSTUBE CUFF** C7-4  
SCALE 3X



**DETAIL F:  
CUFF TRANSITION** A5-4  
NOT TO SCALE



**DETAIL E:  
TAPER RUN-OFF** C3-4  
NOT TO SCALE

**RELEASED**  
2011-01-18

DESIGN	DP	<b>DART AEROSPACE LTD</b>	
DRAWN	DP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	AK	DRAWING NO.	REV. F
MFG. APPR.	BE	D350-748-141	SHEET 4 OF 4
APPROVED	BE	TITLE	SCALE
DE APPR.	BE	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**METLAB**

**1000 E. MERMAID LANE**

**WYNDMOOR, PA 19038**

Voice: 215-233-2600

Fax: 215-233-5653

Sold To:

DART AEROSPACE

1270 ABERDEEN STREET

HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE

1270 ABERDEEN STREET

HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO16600	Net 30 Days
	Ship Via	Process
	YRC	

Quantity	Item	Description	Total Shipped	This Shipme
1.00	✓	1 PC. 74672 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		
1.00	✓	1 PC. 74673 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		
1.00	✓	1 PC. 74676 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		
1.00	✓	1 PC. 74678 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		

COMMENTS

SHIPPED BY SIGNATURE  
METLAB

DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE

**METLAB**  
**1000 E. MERMAID LANE**  
**WYNDMOOR, PA 19038**

**Packing L**

Sales Order Num

71

Sales Order I

Apr 3, 2

F

Voice: 215-233-2600  
Fax: 215-233-5653

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO16600	Net 30 Days
	Ship Via	Process
	YRC	

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 1 PC. 74712		
1.00	✓	D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 1 PC. 74718		
1.00	✓	D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 1 PC. 79010		
		D-350-748-141TRN CROSSTUBE		

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

5/1/12  
DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE

**METLAB**  
**1000 E. MERMAID LANE**  
**WYNDMOOR, PA 19038**

**Packing L**

Sales Order Nur

71

Sales Order I

Apr 3, 2

F

Voice: 215-233-2600  
Fax: 215-233-5653

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO16600	Net 30 Days
	Ship Via	Process
	YRC	

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 1 PC. 79011 D-350-748-141TRN CROSSTUBE		
1.00	✓	HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 1 PC. 79013 D-350-748-141TRN CROSSTUBE		
1.00	✓	HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 1 PC. 73372 D-350-748-141TRN CROSSTUBE		
		HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

5/1/12  
DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE

**METLAB**  
**1000 E. MERMAID LANE**  
**WYNDMOOR, PA 19038**

**Packing L**

Sales Order Nun

71

Sales Order I

Apr 3, 2

F

Voice: 215-233-2600  
Fax: 215-233-5653

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO16600	Net 30 Days
	Ship Via	Process
	YRC	

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	1 PC. 73375 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)\		
1.00	✓	1 PC. 79391 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		
1.00	✓	1 PC. 79392 D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC)		
1.00	✓	1 PC. 79393		

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE

**METLAB**  
**1000 E. MERMAID LANE**  
**WYNDMOOR, PA 19038**

**Packing L**

Sales Order Nur

71

Sales Order I

Apr 3, 2

F

Voice: 215-233-2600  
Fax: 215-233-5653

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO16600	Net 30 Days
Ship Via	Process	
YRC		

Quantity	Item	Description	Total Shipped	This Shipm
		D-350-748-141TRN CROSSTUBE HEAT TREAT TO MIN 180 KSI (MIL-T-6736OR AMS 2759-IC) 560 POUNDS TOTAL		

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

5/1/12  
DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093  
Tel. (215) 233-2600 Fax (215) 233-5653

## Certification

### SOLD TO

Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7

May 1, 2012

---

<b>Metlab Shop Order No:</b>	71785
<b>Purchase Order:</b>	16600
<b>Description:</b>	Crosstube
<b>Part No.:</b>	D350-748-141TRN
<b>Quantity:</b>	14 Pieces
<b>Weight:</b>	560 Pounds
<b>Material:</b>	4130 Alloy Steel
<b>Specifications:</b>	Heat Treat to Minimum 180 KSI (MIL-T-6736OR AMS 2759-IC)

---

This is to certify that the above parts were processed as indicated above and conform to the specification requirements.

### Results:

HRC 40 (182 KSI Tensile Strength)

METLAB

Quality Representative Mark Podob

MERCURY CONTAMINATION: During the heat treating process, testing and inspections, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing device.



Heat Treating and Metallurgical Consulting